

REMARKS/ARGUMENTS

Amendments

Applicant has amended various paragraphs of the specification in accordance with the Examiner's suggestion to eliminate references to claims that have been cancelled and withdrawn. The specification now reads not with references to the claims, but rather with references to examples.

Applicant respectfully submits that these amendments add no new matter to the application and earnestly solicits entry thereof.

Claims 7 and 9 have been amended to clarify the subject matter applicant regards as the invention. Both claims have been clarified by addition of the chemical composition of the stimuable phosphor, "BaFBr:Eu²⁺." Support for this amendment is found at page 16, lines 10-15, and paragraph 26, lines 23-25

Claim 7 also has been clarified by specifically reciting how a gated photomultiplier tube is used as the photodetector, and how the photomultiplier tube is controlled. Support for this amendment is found at page 17, lines 15-17, and page 26, line 26 to page 27, line 28.

Claim 9 also has been clarified by reciting that a single pulse of stimulated fluorescence may be emitted synchronously with pulsed exciting light. Support for this amendment is found in the specification at page 29, lines 21-25.

Applicant respectfully submits that these amendments introduce no objectionable matter to the claims and earnestly solicits entry thereof.

The Office Action

Claims 7-9 were examined, and the remaining claims (10-12, 21-25, and 27-30) have been withdrawn from consideration in view of Applicant's response to the restriction requirement.

Claims 7-9 stand rejected under 35 U.S.C. § 103(a) as unpatentable in view of McKeever, United States Patent No. 5,962,857, in view of Warburton, United States Patent No. 6,169,287. The office action admits that McKeever does not identify the manner in which the pulse signal is acquired, and relies on the skill in the art, allegedly inherent features, and obvious design choice to form the rejection of claim 7. The rejections of claims 8 and 9 also rely on the skill of the practitioner as it relates to a disclosure that not only does not disclose, but also does not suggest, a feature relied upon by the Examiner.

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Applicant respectively traverses the rejection of claim 7. Claims 7 and 9 have been amended to clarify that the stimuable phosphor is BaFBr:Eu²⁺. In McKeever, a stimuable phosphor of α -Al₂O₃:C having a fluorescence lifetime of more than 10 ms is illuminated with a pulsed exciting light having a very long irradiation time (20ms) to detect a dose of stimulated fluorescence. Applicant respectfully submits that McKeever's 10 ms neither suggests nor discloses the claimed <2 μ s. Therefore, McKeever cannot use a signal treating process. Similarly, McKeever's range of " μ s to ms" doesn't suggest a fluorescence lifetime of <2 μ s.

To the contrary, the present invention is characterized by illuminating a stimuable phosphor having a fluorescence lifetime of no longer than 2 μ s with pulsed exciting light having an irradiation time not longer than the lifetime of stimulated fluorescence from the stimuable phosphor to obtain a pulse signal of stimulated fluorescence similar to a signal from a

semiconductor detector. The pulse signal is treated by the well-known signal treating process for a semiconductor detector to easily detect the dose of the stimulated fluorescence at high speed.

That is, the method of claim 7 would not have been obvious at the time the invention was made because the present invention illuminates a stimuable phosphor having a fluorescence lifetime of no longer than 2 μ s with pulsed exciting light having an irradiation time not longer than the lifetime of stimulated fluorescence from the stimuable phosphor to obtain a pulse signal of stimulated fluorescence similar to a signal from a semiconductor detector.

Similarly, Applicant respectfully traverses the rejection of claim 8. As set forth above, McKeeever requires a long gate duration (20ms). Thus, a mechanically controlled shutter under computer control is used to open an optical gate on the photomultiplier tube.

In contradistinction, the present invention is characterized by illuminating a stimuable phosphor having a short fluorescence lifetime of no longer than 2 μ s with strong pulsed exciting light having a very short irradiation time (2 ns) to emit stimulated fluorescence, and detecting the fluorescence with a photomultiplier tube equipped with an electronically controlled gate without influence of the exciting light.

That is, the method of claim 8 would not have been obvious at the time it was made because use of a stimuable phosphor having a fluorescence lifetime of no longer than 2 μ s requires a photomultiplier tube equipped with an electronically controlled gate in place of a photomultiplier tube equipped with a mechanically controlled gate.

Applicant respectfully traverses the rejection of claim 9. The method of claim 9 is characterized by illuminating the stimuable phosphor with pulsed exciting light having an irradiation time that is not longer than twice the lifetime of stimulated fluorescence from the stimuable phosphor, detecting the emitted fluorescence, picking up the detected signal for the

emitted fluorescence as a pulse signal, performing coincident counting on the pulse signal and a read signal constructed using a signal indicating the time duration of illumination with the pulsed exciting light, wherein the stimulated fluorescence signal is picked up on the basis of its having been output in accordance with the lifetime of fluorescence upon illumination with the pulsed exciting light, and the dose of stimulated fluorescence is measured by repeatedly illuminating the pulsed exciting light, as shown in Fig. 13.

That is, the method of claim 9 would not have been obvious at the time it was made because it provides a feature of repeatedly illuminating the stimuable phosphor having a fluorescence lifetime of no longer than 2 μ s with the pulsed exciting light to detect only stimulated fluorescence emitted synchronously with the pulsed exciting light.

Thus, Applicant respectfully submits that the claims are in condition for allowance and earnestly solicit favorable action thereon.

Respectfully submitted,

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